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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/868,988	11/08/2001	Sture Helmersson	19378.0012	6778

7590 11/05/2002

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EXAMINER

PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/868,988

Examiner

Rick Palabrica

Applicant(s)

HELMERSSON ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2002.
- 2a) ☐ This action is FINAL.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6

- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. Applicant's election with traverse of Species C (the embodiment in Fig. 2C) and G (absorber material consisting of boron and hafnium) in Paper No. 9, is acknowledged. This election is in response to Office Action dated September 12, 2002.

2. Applicant alleges that claims 1-7, 11 and 12 are readable on the elected species C and G. The examiner disagrees that claim 12 is readable because said claim pertains to a non-elected absorber material species of boron carbide and hafnium metal. Accordingly, only claims 1-7 and 11 are examined in this Office Action.

3. The Examiner cited Nishimura et al. in said Office Action as an example of prior art that illustrates the lack of a common "special technical feature" among the species in the claimed invention. The traverse is on the ground(s) that the inventive concept in claims, such as claim 1, define over Nishimura et al. This is not found persuasive because, as shown in section 5 below, the language of claim 1 reads on Nishimura et al.'s invention. Alternatively, the other prior art cited in section 5 to reject claims can also be the basis for a lack of common special technical feature among the disclosed species of the claimed invention. The other argument by the applicant that the invention is not restricted to an absorber made of a particular material is not germane to the "lack of unity of invention" issue.

The requirement is still deemed proper and is therefore made FINAL.

Specification

3. The disclosure is objected to because of the following informalities:
- On page 3, line 26, the applicant makes reference to U.S. patent application No. 367,099. This application number is invalid.
 - On page 4, line 26, the applicant makes reference to U.S. patent application No. 659,436. This application number is invalid.
- Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-7 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "radically inside an outer part" in line 13. The term "radically" is a relative term that renders the claim indefinite. This term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite

degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Terms such as "upper part", "lower part", "inner part", "outer part", etc. are relative, they can be given no definite meaning and accordingly they render the claims vague and indefinite, and the metes and bounds thereof are undefined (e.g., see claims 1, 2, 3, 4, 5)

Terms such as "absorber blade", "absorber material" are vague and indefinite because they can be interpreted in different ways, i.e., either as gamma ray absorber, neutron absorber, charged particle absorber, or others (e.g., see claim 1).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-7 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueda et al. (U.S. 5,034,185). Ueda et al. disclose reactor control blades for a boiling water reactor that are designed to increase the reactor shutdown margin and extend their lifetime (see Figs. 1-42). Fig. 1 shows a cruciform control rod wherein each one of the absorber blades comprises an absorber material distributed in the longitudinal direction, whereby the mean value of the absorber material per unit length of the control

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rod is smaller in the upper part than in the lower part (see column 9, lines 22+ and also Figs. 12A-12G). Figs. 12A-12G show different embodiments wherein the upper part of a blade has a lower amount of absorber material than a lower part. This upper part also constitutes at most one-third of the length of the blade. The neutron absorber blades comprise a plurality of radially arranged channels having equal diameters. Ueda et al. further disclose the absorber material consisting of hafnium and/or boron (e.g., see column 8, lines 60+ and column 38, lines 2+).

Fig. 36A shows an embodiment that exemplifies the outer part of the blade being provided with absorber material and the inner part lacking absorber material. Note that the inner part constitutes at least one-third of the blade width. Fig. 36A also discloses an example of engagement recesses (633, X_d) being formed by partially cutting the inner end of the neutron absorber blade in the width wide direction, whereby the recess in the upper part is wider than the recess in the lower part. The specific number of these recesses is a matter of engineering choice. This figure further illustrates an example of channels in the upper part being shorter than in the lower part.

As to the relative dimensions of the parts of the blade discussed above, note that while patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of the claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Nishimura et al. (U.S. 4,451,428).

Applicant's claim language reads on Nishimura et al.'s control rod for a boiling water reactor (see Figs. 1-7). Note that their control rod blades are arranged in the form of a cross in transverse cross section, with absorber material distributed in the longitudinal direction. Figs. 2A and 2B show the distribution of neutron absorber capacity along the control rod length. Applicant's claim language "upper part" reads on any or the entire blade section 8, and "lower part" reads on any or all of blade section 7. Note from Fig. 2B that the mean value of neutron absorbing capacity is lower in the upper part than in the lower part. There is zero neutron absorbing capacity (equivalent to claim language "lacks absorber material") at the top part of section 8 that includes an "inner part" near tie rod 3. This "inner part" can be at least one-fourth of the width of the neutron absorber blade.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (JO 1148-998-A) [hereinafter referred to as over Ueda et al. (JO)], in view of Ueda

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et al. (U.S. '185). Ueda et al. (JO) disclose the applicant's claims except for details on the blade construction.

Ueda et al. (JO) disclose a control rod for a boiling water reactor wherein the total amount of neutron absorber is gradually decreased longitudinally toward the insertion terminal side, i.e., the upper part of the blade (see English Abstract and page 8 of English language translation). The absorber material comprises hafnium and boron (see page 16, last paragraph of the English language translation).

As discussed in section 6 above, Ueda et al. (U.S. '185) disclose a similar control rod for a boiling water reactor with details on the relative dimensions of the upper and lower parts of the blades, relative dimensions of the inner and outer parts, recesses and channels. Both Ueda et al. (JO) and Ueda et al. (U.S. '185) are in the same field of endeavor.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control rod, as disclosed by Ueda et al. (JO), by the teaching in Ueda et al. (U.S. '185), in order to have a control rod having: a) an upper part wherein the outer part has absorber material whereas the inner part has none; b) an inner part that constitutes at least one-third of the blade width; c) an upper part length that is at most one-third of the blade length; d) a plurality of recesses in the inner part of the blade wherein the recesses in the upper part are wider than in the lower part; e) a plurality of channels having equal diameters and the majority of channels in the upper part are shorter than in the lower part, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

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Conclusion

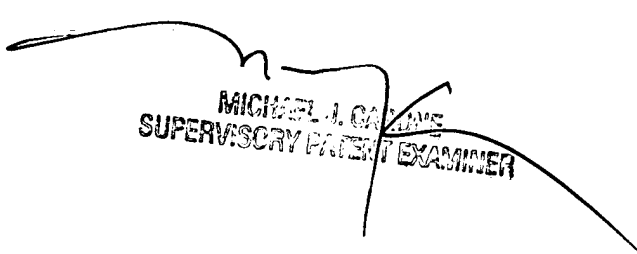
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C, D and U further illustrate prior art.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 7:00-4:30, Mon-Fri; 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

RJP
October 29, 2002


MICHAEL J. CARONE
SUPERVISORY PATENT EXAMINER